LISTING OF THE CLAIMS

A copy of all pending claims and a status of the claims is provided below.

1. (Original) A method for optimizing pricing and capacity for bandwidth management using a computer, comprising the steps of:

inputting a mean and a variance of real usage for each of a plurality of customer classes;

inputting price and demand curve data which determines an arrival rate for each customer class;

inputting a number of existing customers in each customer class;

inputting a bandwidth wholesale cost;

generate a computer model for an optimization problem subject to a plurality of predetermined chance constraints;

solving said optimization problem using said computer to determine an amount of bandwidth to be purchased in a time period at a given price for an expected number of new customers in order to maximize profit; and

outputting said amount of bandwidth to be purchased and said expected number of new customers.

2. (Previously presented) A method for optimizing pricing and capacity for bandwidth management using a computer as recited in claim 1 wherein said plurality of predetermined chance constraints comprises:

$$b_\tau = b_{\tau-1} + a_\tau \qquad (\tau = 1,\ldots,T) \quad (1)$$

$$L_{i\tau} \le q_{i\tau} \le U_{i\tau} \qquad (i = 1,\ldots, I;\ \tau = 1,\ldots, T) \qquad (2)$$

$$\sum_{i|\tau<d_i} [\lambda_{i\tau}\Delta\mu_i^2 + (n_{i\tau} + \lambda_{i\tau}\Delta)^2 \sigma_i^2 + (n_{i\tau} + \lambda_{i\tau}\Delta)^2\mu_i^2]$$

$$+ \sum_{i|\tau\geq d_i} [\lambda_i D_i(\mu_i^2 + \sigma_i^2)] + (\lambda_i D_i\mu_i)^2] - \delta_\tau b_\tau^2 \leq 0 \quad \forall\tau \qquad (3)$$

and said optimization problem comprises:

$$Maximize \sum_{i,\tau} q_{i\tau}\lambda_i(q_{i\tau}) - \sum_{\tau} C_\tau a_\tau \qquad (4)$$

wherein:

$i = 1,\ldots,$ I: customer class;

$\tau = 1,\ldots,$ T: time periods, each of length Δ;

δ_τ is tolerance on capacity violation in period τ;

C_τ is cost per unit of buying new capacity in period τ;

d_τ is duration of contractfor customer class i;

D_i is actual duration of contract ($d_i\Delta$) for customer class i;

$n_{i\tau}$ is a number of existing contracts of type i still active at start of period τ;

$L_{i\tau}$ is a lower bound on contract price;

$U_{i\tau}$ is an upper bound on contract price;

b_τ is bandwidth available in period τ;

a_τ is bandwidth purchased by re-seller in period τ;

$q_{i\tau}$ is price to new or renewing customers for a new standard length contract of type i in period τ;

$\lambda_i(q_{i\tau})$ is expected number of new customers of type i arriving in any period if a price for a contract is set at $q_{i\tau}$;

$\forall\tau$ is an index of a discrete time interval;

μi is mean time with customer class i; and

δi is probability with customer class i.

3. (Original) A method for optimizing pricing and capacity for bandwidth management using a computer as recited in claim 1 wherein said computer solving and optimization problem is running a non-linear programming software.

4. (Original) A computer readable medium comprising software for causing a computer to execute steps for optimizing pricing and capacity for bandwidth management, comprising the steps of:

receiving a mean and a variance of real usage for each of a plurality of customer classes;

receiving price and demand curve data which determines an arrival rate for each customer class;

receiving a number of existing customers in each customer class;

receiving a bandwidth wholesale cost;

generating a computer model for an optimization problem subject to a plurality of predetermined chance constraints;

solving said optimization problem using said computer to determine an amount of bandwidth to be purchased in a time period at a given price for an expected number of new customers in order to maximize profit; and

outputting said amount of bandwidth to be purchased and said expected number of new customers.

5. (Previously presented) A computer readable medium comprising software for causing a computer to execute steps for optimizing pricing and capacity for bandwidth management as

recited in claim 4 wherein said plurality of predetermined chance constraints comprises:

$$b_\tau = b_{\tau-1} + a_\tau \qquad (\tau = 1,\ldots,T) \qquad (1)$$

$$L_{i\tau} \le q_{i\tau} \le U_{i\tau} \qquad (i = 1,\ldots, I;\ \tau = 1,\ldots, T) \qquad (2)$$

$$\sum_{i|\tau<d_i} [\lambda_{i\tau}\Delta\mu_i^2 + (n_{i\tau} + \lambda_{i\tau}\Delta)^2\ \sigma_i^2 + (n_{i\tau} + \lambda_{i\tau}\Delta)^2\mu_i^2]$$

$$+ \sum_{i|\tau\ge d_i} [\lambda_i D_i(\mu_i^2 + \sigma_i^2)] + (\lambda_i D_i \mu_i)^2] - \delta_\tau b_\tau^2 \le 0 \quad \forall\tau \qquad (3)$$

and said optimization problem comprises:

$$Maximize \ \sum_{i,\tau} q_{i\tau}\lambda_i(q_{i\tau}) - \sum_\tau C_\tau a_\tau \qquad (4)$$

wherein:

$i = 1,\ldots,$ I: customer class;

$\tau = 1,\ldots,$ T: time periods, each of length Δ;

δ_τ is tolerance on capacity violation in period τ;

C_τ is cost per unit of buying new capacity in period τ;

d_τ is duration of contractfor customer class i;

D_i is actual duration of contract $(d_i\Delta)$ for customer class i;

$n_{i\tau}$ is number of existing contracts of type i still active at start of period τ;

$L_{i\tau}$ is a lower bound on contract price;

$U_{i\tau}$ is an upper bound on contract price;

b_τ is bandwidth available in period τ;

a_τ is bandwidth purchased by re-seller in period τ;

$q_{i\tau}$ is price to new or renewing customers for a new standard length contract of type i in period τ;

$\lambda_i(q_{i\tau})$is expected number of new customers of type i arriving in any period if a price for a contract is set at $q_{i\tau}$;

$\forall\tau$ is an index of a discrete time interval;

μi is mean time with customer class i; and

δi is probability with customer class i.

6. (Original) A computer readable medium comprising software for causing a computer to execute steps for optimizing pricing and capacity for bandwidth management as recited in claim 4 wherein said computer solving and optimization problem is running a non-linear programming software.